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The Effects of Budget Deficit on Economic Growth and Development: The Experience of Ghana (1994 – 2014)

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Abstract

This paper surveyed and access the empirical literature on the sources of budget deficit and their policy implications on the processes of sustainable economic growth and development. The Ghanaian experience and evidence shows that the budget is not projected to be on a sustainable growth path under current socio-economic and political (governance) policies; the budget is projected to increase more quickly than the country's Gross Domestic Product (GDP). The modeling of underlying variables (Inflation, Gross Domestic Product, Real Interest Rate, Gross Investment, Real Exchange Rate) to estimate the quantitative effect of continued budget deficit on the rate of economic growth, governance and development. The sample used for this study is based on panel data-sets between 1994 and 2014. Results obtained from the analysis pointed to an adverse impact of continued budget deficit on the processes of economic growth and development. The paper recommends the adoption and implementation of policies that could reverse the un-sustained budget deficit leading to crowding out of the private investment but rather, put the economic on a sustained path of growth and, development in the medium to long term.

Keywords: Budget deficit, economic growth, governance and sustainable development

Introduction

The relative successful implementation of fiscal austerity policies under the Structural Adjustment Programme (SAP) let to the Ghanaian economy enjoying years of increased annual economic growth of 3.8% in 1984 to 15% in 2011 (Bank of Ghana, 2014; IMF, 2014a; ISSER, 2013). The exceptional growth rate in 2011 is primarily accounted for by the on-coming petroleum exploitation and henceforth, the more appropriate comparison should be that of non-oil real Gross Domestic Product (GDP) growth rate in 9.4% in 2011; falling to 7.8% in 2012 and sadly to 3.9% in

2013 (IMF, 2014a). The inability of the Ghanaian economy to maintain the momentum path of growth has raised many questions about the very long-term sustainability of the growth trajectory of the economy. The underlying variables for this heighten concern include the unfortunate large merchandise trade deficits, depreciation of the national currency against major international currencies, intermittent electricity and power supply and a very large national budget deficit partly accounted for by over-spending particularly during the 2012 national election.

According to the World Bank (2015), small grant programme, a budget is key management tool for planning, monitoring, and controlling the finances of a project or organization. It thus, estimates the income and expenditures for a set period of time for a project or an organization. Therefore, a budget serve a number of important purposes including: (1). Monitoring the income and expenditures over the course of a year (or specific project time frame); (2). Helping to determine if adjustments need to be made in programmes and goals; (3). Forecasting income and expenses for projects, including the timing and the availability of income such as additional grant funds; (4) and providing a basis for accountability and transparency. A budget could result in deficit or surplus. A surplus is recorded when revenue generated exceeds planned expenditure (Evans, 1987a; Elmendorf, 1993; Elmendorf, 1996; Elmendorf and Liebman, 2000). However, a deficit is recorded when expenditures of the national economy exceeds planned revenue; could be attributed to delays in revenue collection, and/or low receipts from exports *etc* (Bahmani, 1999; Still, 2005).

Tas (1990), reviewing the standard model argues that there is an assumption that the substitution of a budget deficit for current taxation leads to an expansion of aggregate consumer demand. Thus, the desired private saving rises by less than the tax cut, so that desired national saving declines. Relatively, in a closed economy, the expected real interest rate would have to rise to restore equality between desired national saving and investment demand; the higher real interest rate crowds out investment, which shows up in the long run as a smaller stock of productive capital. In the worlds of Modigliani and Sterling (1986), the resulted public debt is an inter-generational burden primarily leads to a smaller stock of capital, for future generations.

On the other hand, in an open economy, a small country's budget deficits would have negligible effects on the real interest rate in international capital markets. Therefore, in the standard analysis, the home country’s decision to substitute a budget deficit for current taxes leads mainly to increased borrowing from abroad, rather than to a higher real interest rate. Henceforth, the budget deficits lead to current account deficits. Expected real interest rates rise for the home country only if it is large enough to influence

world markets or if the increased national debt induces foreign lenders to demand higher expected returns on this country's obligations. Tas (1990), suggests that in any event there is a weaker tendency for a country's budget deficits to crowd out its domestic investment in the short run and its stock of capital in the long run. However, the current account deficits show up in the long run as a lower stock of national wealth and correspondingly higher claims by foreigners.

Ghana's budget deficit in the fiscal year 1994 was around -3.5% of GDP; reduced to -2.8% in 2004; exceptionally increased to -24.2% of GDP in 2012 and, fell to -9.5% in 2014 respectively (Ghana Statistical Service, 2014; International Financial Statistics, 2013).

The paper is divided into six sections. Section one contains the introductory aspect of the paper. Section two brings to light the problem statement which forms the axis of the study. Section three presents the literature review and theoretical framework within which the study is conducted. Section four on the other hand concentrates on the design, empirical methodology and data requirements of the study. The analysis of the results obtained is carried out in section five and, section six presents the conclusion and recommendations of the paper.

The Problem Statement

As suggested by Tas (1990), there is a tendency for a country's budget deficits to crowd out its domestic investment in the short run and its stock of capital in the long run. Therefore, the current account deficits show up in the long run as a lower stock of national wealth and correspondingly higher claims by foreigners. The main problem of this study is to investigate the impact of budget deficit on GDP in terms of its implications on the sustainable processes of economic growth and development. In addition, with Ghana as its laboratory, the papers as part of its objectives intends to identify, investigate, and analyze the causes of budget deficit; investigate the impact of budget deficit on the rate of economic growth; and recommend appropriate and suitable policies to overcome the continued budget deficit.

Literature Review and Theoretical Framework

The ever increasing budget deficits and its attended consequences have raised heated discussions in both advanced, emerging and developing economies. It is therefore important to review the links between budget deficits and escalating government debt on the processes of sustainable economic growth and development. There are three schools of thought on the effects of budget deficit on economic growth and development. These includes the Neo-classical, Ricardian Equivalence/Ricardo – De Viti Barro Equivalence and, the Keynesian theoretical frameworks respectively. By

assuming full employment of resources the Neo-classical paradigm maintains that budget deficit increases current consumption as individuals shift taxes to future generations. Increased consumption leads to decrease in saving and interest rates therefore, must rise to bring equilibrium in the capital markets. Increased interest rates thus, result in a decline in private sector in the form of investments; crowding-out effect of budget deficit (Bernheim, 1989). Instead of the "crowding-out" effect, Keynesians espouse a "crowding-in" effects of budget deficits. Keynesians counter argument against crowding-out effects is brought to the fore in reference to the expansionary effects of budget deficits. Henceforth, budget deficits results in an upsurge in domestic production underpinning private investors' optimism about the future growth path of the economy. The Keynesian paradigm allows the possibility that certain degree and/or amount of economic resources are unemployed. Furthermore, it presupposes the existence of a large number of liquidity constrained consumers. This assumption guarantees that aggregate consumption is very sensitive to changes in individual disposable incomes (Saleh, 2003). The degree of public capital crowding-out or crowding-in private capital depends on the relative strength of two opposing forces. First, as a substitute in production for private capital, public capital tends to crowd out private capital; secondly, by raising the return to private capital, public capital tends to crowd in private capital. On the whole, public capital crowding-out and/or crowding-in private capital depends on whether public and private capital are gross substitutes or gross complements (Aschauer, 1989b; Saleh, 2003). The Ricardian equivalence paradigm espouses that increases in budget deficits (for instance, through government spending) must be paid for either today or in the future with the total present value of receipts fixed by the total present value of spending. This implies that a reduction in today's tax receipts must be matched by a corresponding increases in future taxes; leaving interest rates, and private investment unchanged (Bernhein, 1989).

There are major objections to the Ricardian equivalence paradigm: (1). those alive care about taxes levied today not after their death hence, net wealth of persons currently alive rises and households react by increasing consumption demand __ *finite horizons*; (2). Government implicitly guarantee's the repayment of loans through its tax collections debt payment __ *imperfect loan markets*; (3). uncertainty about future taxes and/or the complexity in estimating them implies high rate of discount in capitalizing these future liabilities __ *uncertainty about future taxes and incomes*; (4). in situations where taxes are not lump sum (for instance, with an income tax), budget deficits change the timing of income taxes and thereby affect individuals' incentives to work and produce in different periods __ *the timing of taxes* (Tas, 1990).

Design, Empirical Methodology and Data Requirements

The design and selection of an appropriate theoretical framework provides the reader with a clue as to the potential effects of budget deficits; the phenomenon contextually is indeed empirical. The discussion centers on the traditional school of thought that argues that budget deficit resulting from government spending thus, crowds-out the private sector hence, investment. The non-traditional view runs counter to the former as it maintains that government expenditure rather stimulates investment therefore increases the rate of economic growth and development. Employing the Granger causality test Guess and Koford (1984), investigated the relationship between budget deficits and inflation, Gross National Product (GNP), private sector investment based on panel data sets selected from the Organisation of Economic Cooperation and Development (OECD) within the time span of 1949 to 1981. The study concluded that budget deficits in the form of government expenditure do not cause changes in the noted variables. In a cross-sectional study of one hundred countries, Landau (1983), concluded that there exists evidence of negative relationship between the growth rates of real GDP per capita and the percentage share of government expenditure. On the other hand, Kormendi and Meguire (1985), cited in Saleh (2003), after examining forty-seven countries in 1950 and 1977 concluded that there was no significant cross-sectional relationship between the growth rate of real GDP and the growth rate of government consumption spending on output. Similar, Aschauer (1989b), cited by Saleh (2003), empirically examined annual data for the United States of America (USA) over the period 1953 – 1986 of the effect of government expenditure on private investment as well as the rate of return on private capital. He equally concluded by arguing that an increase in government expenditure may be expected to reduce private investment nearly one-to-one as the private sector employs the public capital for its required purposes instead of expanding private capacity. Public infrastructure capital complements private capital in the production and distribution of private goods and services. In the nutshell, government investment had a positive effect on private investment decisions and caused crowding-in rather than crowding-out. However, in Barro (1991), a study of 98 countries over the period 1960-1985 findings alluded to the fact that there existed a negative interrelationship between the output growth rate and the share of government consumption expenditures.

Examining the impact of budget deficit on real exchange rate Gulcan and Bilman (2005), with the help of co-integration method and causality test applied ADF, PP and RPSS unit root test to inquire about the stationarity of the individual time series. Based on Turkish data-sets over the time period 1960 to 2003, they concluded that there exists significant impact of budget deficit on real exchange rate and trade balance. This was collaborated by

Hakkio (1996), based on data from Sweden and Finland. Running a simple regression analysis Hakkio (1996), depicted the existence of negative relationship between budget deficit and exchange rate in these two countries. Furthermore, Huynh (2007), employing data from Vietnam over the time period of 1990 to 2006 was able to show that continuous budget deficit had negative impact on the country's GDP growth rate. Drawing on the arguments as espoused by Neo-classical economists, he concluded that such adverse impact on GDP growth rate crowded-out the private sector investment during the time period under consideration. In contrast, Cebula (1988), studying the data-sets of USA over the time frame of 1971 to 1984 pointed out significant positive impact on long-term nominal rate of interest due to increased budget deficits. Saleh (2003), maintains that increased budget deficit results in different impact on different economic variables within the time period under study and/or review. Thus, invariably increased budget deficits reduce national saving and future income even in situations' whereby international capital flows are used to avert increases in interest rates. Controlling for other variables, expected future budget deficits have the tendency to negatively impact current long-term bond yields (Gale and Orszag, 2003). Taking a clue from Saleh's (2003), observation Vit (2004), argues that increases in budget deficits thus, have adverse impact on the rate of inflation, current account balance and ultimately negatively on the sustainable growth and development of the economy.

To model and analyze the impact of increased budget deficits on GDP growth and development, the paper uses the model as espoused by Shojai (1999). Ordinary Least Square (OLS) is utilized to underpin inherent assumptions as put forth. These inherent assumptions includes linearity and the non-stochastic characteristics with a mean value of 0 with equal variance of distribution. Ordinary Least Square regression technique could be applied to both single and/or multiple explanatory variables as well as categorical explanatory variables (Tranmer and Elliot, 2008). Henceforth, the model's mathematical formulations is expressed as:

$$\text{Ln (GDP)} = \beta_0 + \beta_1 \text{ 1n (INFL)} + \beta_2 \text{ 1n (EXCH)} + \beta_3 \text{ 1n (RIR)} + \text{1n } \beta_4 \text{ (BD)} + \text{1n } \beta_5 \text{ (GI)} + u$$

Where:

GDP	=	Gross Domestic Product
INFL	=	Inflation
EXCH	=	Real Exchange Rate
RIR	=	Real Interest Rate
BD	=	Budget Deficit
GI	=	Gross Investment
U	=	Stochastic Error Terms

Note: $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ represent respective beta parameters.

The data-sets for this study is sourced from the time period 1994 to 2014 from the World Bank, Ghana Statistical Service, the Bank of Ghana (BOG), Ministry of Finance (Ghana) and the International Financial Statistics.

Results and Analysis

The results presented obtained by the process of scrutinizing and summarizing the data-sets and more importantly for model formulation as part of the iterations involving regression, unit root and stationarity analysis via Dickey-Fuller test (ADF). Thus, correlation and multiple regression analyses were conducted to examine the relationship between increased budget deficits on GDP and various potential predictors underpinning the processes of economic growth and development. Table 1 below presents a summary of the regression test as conducted.

Table 1: Summary Statistics, Correlations and Results from the Regression Iterations

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.726709982
R Square	0.528107399
Adjusted R Square	0.370809865
Standard Error	1.954496431
Observations	21

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	5	64.12688	12.82538	3.357379	0.031124
Residual	15	57.30084	3.820056		
Total	20	121.4277			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-6.524434468	6.138631	-1.06285	0.304663	-19.6086	6.559749	-19.6086	6.559749
INF	0.012221082	0.050669	0.241195	0.81267	-0.09578	0.120219	-0.09578	0.120219
EXCH	3.976923618	1.958515	2.030581	0.060416	-0.19755	8.1514	-0.19755	8.1514
RIR	0.069784702	0.039549	1.764491	0.097997	-0.01451	0.154082	-0.01451	0.154082
BD	0.16652671	0.107484	1.549311	0.142145	-0.06257	0.395624	-0.06257	0.395624
GI	0.123700794	0.121588	1.017376	0.325104	-0.13546	0.38286	-0.13546	0.38286

Source: Authors Compilation, (2015).

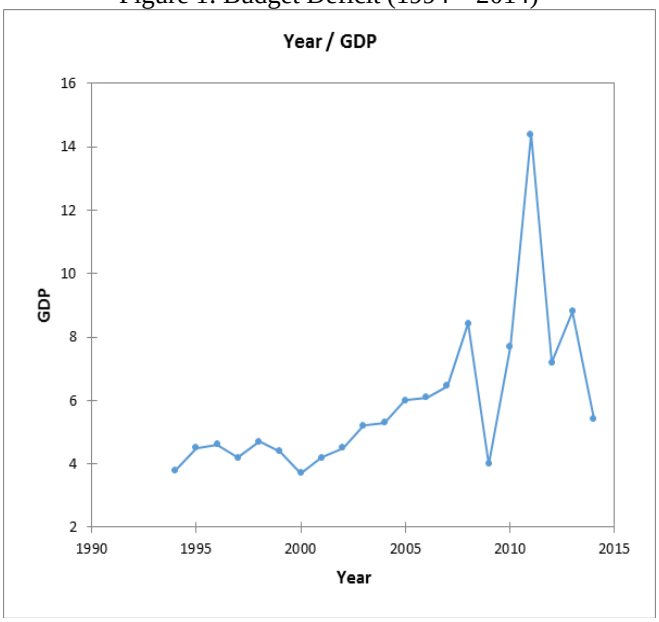
The correlation coefficient ($\boldsymbol{R}$ = 0.726) of 72% depicts a strong relationship explanatory variables and the predicted variable _ economic growth and development: GDP. The coefficient of determination or the coefficient of multiple determination ($\boldsymbol{R^2}$ = 0.528) for multiple regression is a good fit. 52% of the variation in GDP is explained by the independent variables. Thus, the $\boldsymbol{R^2}$ is depicting how much change in the dependent variable GDP is explained by associated independent variables. The significance value of 0.31124 < 0.05 shows that it's significant as the results obtained didn't occur by chance; validates the model.

In addition, the Ordinary Least Test (OLS) taking GDP as the dependent variable between the years 1994 and 2014 shows that a positive

impact of gross investment (GI) on the processes of economic growth (β_5 = 0.123700794, p = 0.325104). Henceforth, 5% increase in GI will lead to 0.12 times increase in GDP which could be attributed to the discovery of oil in commercial quantities and increases in associated infrastructure developments across board. The results thus, confirms Aschauer (1989b), cited by Saleh (2003), that public infrastructure capital complements private capital in the production and distribution of private goods and services; equally in conformity with Keynesian economics (Keynes, 1936; Blinder, 1991), that government investment has a positive effect on private investment decisions and caused crowding-in rather than crowding-out.

However, results in table 2 below shows that budget deficit (BD) indeed has a significant and adverse impact on GDP (β_4 = -0.036, p = 0.395624). Depicting the fact that 5% increase in the BD (See figure 1_ showing increasing budget deficits since 1994 with the highest recorded rate of -24.2% in 2012) in results in 0.36 times decrease in the country's GDP. The obtained results validates the findings attributed to Anusic (1993), that an increase in the real interest rate leads to a decrease in real investment.

Figure 1: Budget Deficit (1994 – 2014)



Source: Authors Compilation, (2015).

As showed by figure 1, the level of budget deficit has been increasing and according to Sachs and Larrain (1993), could be attributed to the country's socio-political and economic history and culture. It's noted that in political models of government behavior where incumbent administrators are more than willing to spend as a means of raising aggregate demand in their respective economies particularly, during elections years through tax cuts,

transfer payments and plain over-expenditure and/or through lower than anticipated foreign exchange receipts and domestic tax revenue. Such occurrences are noted in developing economies where political power easily change hands between rival parties, governments over spend above its budget and deliberately hold on until after the election before implementing policies to reduce the resultant deficit.

Table 2: Correlation Matrix*

Variables	INF	EXCH	RIR	BD	GI	GDP
INF	1.000	-0.583	0.212	0.126	-0.369	-0.442
EXCH	-0.583	1.000	-0.749	-0.428	0.777	0.588
RIR	0.212	-0.749	1.000	0.207	-0.673	0.588
BD	0.126	-0.428	0.207	1.000	-0.261	-0.036
GI	-0.369	0.777	-0.673	-0.261	1.000	0.553
GDP	-0.442	0.588	-0.278	-0.036	0.553	1.000

Source: Authors Compilation, (2015). *Note:* * 5% level of significant.

From table 2 above it could be deduced that an increase in real interest rate (β_3 = 0.212) leads to a corresponding decrease in the rate of gross investment (GI) of -0.673. This underpins Vit (2004), argument that increases in budget deficits thus, have adverse impact on the rate of inflation, current account balance and ultimately negatively on the sustainable growth and development of the economy.

Table 3, 4 and 5 presents the results of the unit root and stationarity tests conducted in view of the following general and associated sub-hypothesis:

*Null hypothesis (**H_0**):* There is unit root

*Alternative hypothesis (**H_A**):* There is no unit root

Table 3: Dickey-Fuller test (ADF(stationary) / k: 2 / GDP):

Tau (Observed value)	-2.830
Tau (Critical value)	-0.419
p-value (one-tailed)	0.180
alpha	0.05

Source: Authors Compilation, (2015).

Test interpretation:

H_0: There is a unit root for the series.

Ha: There is no unit root for the series. The series is stationary.

As computed p – values is greater than the significance level alpha = 0.05, one cannot reject the null hypothesis **H_0**. The risk to reject the null hypothesis **H_0** while it is true is 17.98%.

Table 4: Phillips-Perron test (PP(no intercept) / Lag: Short / GDP):

Tau (Observed value)	-0.544
Tau (Critical value)	-1.959
p-value (one-tailed)	0.469
alpha	0.05

Source: Authors Compilation, (2015).

Test interpretation:

H_0: There is a unit root for the series.

Ha: There is no unit root for the series. The series is stationary.

As the computed p – value is greater than the significance level alpha = 0.05, once cannot reject the null hypothesis **H_0**. The risk to reject the null hypothesis **H_0** while it is true is 46.85%.

Table 5: KPSS test (Level / Lag Short / GDP):

Eta (Observed value)	0.694
Eta (Critical value)	0.438
p-value (one-tailed)	0.004
alpha	0.05

Test interpretation:

H_0: The series is stationary.

Ha: The series is not stationary.

As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis **H_0** and accept the alternative hypothesis **Ha.**

The risk to reject the null hypothesis **H_0** while it is true is lower than 0.36%.

As part of the processes of testing the normality of the model, the use of logarithmic transformations (scaling the data) of the data-set was implemented.

Table 6: Results of Transformed Data-sets (Statistics)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.829732
R Square	0.688455
Adjusted R Square	0.584607
Standard Error	0.218233
Observations	21

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	5	1.578651	0.31573	6.629433	0.001911
Residual	15	0.714383	0.047626		
Total	20	2.293033			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.22002	0.68542	-0.321	0.752637	-1.68096	1.240916	-1.68096	1.240916
INF	0.002079	0.005658	0.367511	0.718372	-0.00998	0.014138	-0.00998	0.014138
EXCH	0.651161	0.218681	2.977672	0.00939	0.185053	1.11727	0.185053	1.11727
RIR	0.011181	0.004416	2.531921	0.023007	0.001768	0.020593	0.001768	0.020593
BD	0.030248	0.012001	2.520394	0.023538	0.004668	0.055828	0.004668	0.055828
GI	0.017271	0.013576	1.272127	0.222696	-0.01167	0.046207	-0.01167	0.046207

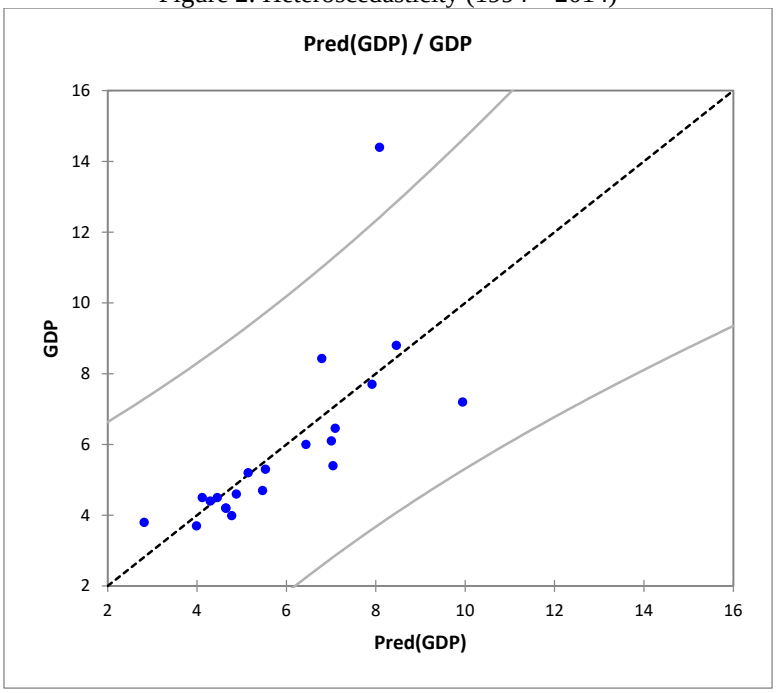
Source: Authors Compilation, (2015).

The correlation coefficient (***R*** = 0.829) is increased to 82% from 72% in table 1 thus, depicting a very strong relationship explanatory variables and

the predicted variable. Similarly, the coefficient of determination or the coefficient of multiple determination (R^2 = 0.688) has increased to 68% from 52% for multiple regression implying a very good fit. The significance value (F) of 0.001911 < 0.05 indeed signify that the results obtained didn't occur by chance; validates the model.

As suggested by Blough (1992), given the low power of unit root tests as presented on previous pages, an acceptance of the null hypothesis that a variable is difference-stationary compared to stationary could be taken as an indication of a spurious regression rather than as firm evidence of difference stationarity. Further to complement the unit root tests, residual diagnostic is carried out to strengthen robustness of the model and as such detect model specification problems. This involved a White test for heteroscedasticity.

Figure 2: Heteroscedasticity (1994 – 2014)



Source: Authors Compilation, (2015).

Figure 2 depicts an almost equal variance (non – stationarity) in the rate of GDP over the time period under study; presenting an image of homoscedasticity conforming to one of the cardinal assumptions of the classical Linear Regression Model (CLRM) hence, OLS estimators are said to be BLUE (Best Linear Unbiased Estimators) inherent within the Gasuss-Markov theorem (Shaffer, 1991).

Conclusion and Recommendations

The paper presented a study on the relationship between of increased and/or continuous budget deficit on the processes of economic growth, governance and development; precisely Gross Domestic Product. Henceforth, to achieve this purpose, an application of unit root test and Ordinary Least Squares (OLS) associated with regression modelling of selected data-sets of Ghana, sourced from the time period 1994 to 2014. Results obtained from the modelling and analysis pointed to an adverse impact of continued budget deficit on the processes of economic growth and development as well as the governance structure of the country. The paper recommends the adoption and implementation of policies that could reverse the un-sustained budget deficit leading to crowding out of the private investment but rather, put the economic on a sustained path of growth and, development in the medium to long term. The penchant and art of borrowing to service previous debts and meet unforeseen budget expenditures must be kept to the barest minimum as that is not the solution for enhanced processes of sustainable economic development. Internally, government could increase its revenue base by holistically implementing the national identification system that to a degree captures each adult citizen's economic activities and hence, payment of both income and property tax respectively. Moreover, unplanned expenditure on white elephants must stop as it only serves as a leakage, increases the rate of inflation and thus, decrease the country's economic growth and development _Gross Domestic Product.

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